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. . . Radio in War is both Vital and Useless . . .

A COMMUNICATIONS PARADOX

By the Editor — HUGO GERNSBACK

THE present war has been termed a mechanized war and a war of communications. One without the other is unthinkable. Coordination of land, sea and air forces is a tremendously vital matter and—as has been shown repeatedly in this war—battles begin to be lost when there is no rapid coordination between the various forces. But, you cannot have rapid coordination without radio nowadays.

Yet paradoxically enough, the all-important radio communication frequently becomes quite useless and we are plunged once more back into the days of the sailing ship, particularly where war-time naval communications with land is concerned. Both in the Atlantic and in the Pacific, it has been demonstrated repeatedly that neither surface vessels nor submarines (nor airplanes for that matter) can safely use radio transmitters during war except under especially favorable conditions. Submarines are wary of using radio lest they betray their position, which usually means quick sinking of the submersible. Nor does a naval armada use radio except in home waters, and often not even then. A naval fleet in enemy waters would commit suicide if it were to transmit radio messages indiscriminately.

Particularly in the Pacific both American and Japanese naval forces cannot use radio transmission at all when it comes to communicate with the home bases. When Japan sent her fleet on their nefarious task which ended on December 7th with Pearl Harbor, they did not betray their whereabouts by radio signalling.

And, when late in April American bombers struck at Japan proper, bombing Tokio, Yokohama and Kobe, paradoxically enough the news to the world did not come from American sources, but from Japanese broadcasts! As we go to press, five days have elapsed and still the United States Navy Department is silent. Of course there are excellent reasons for this. The American Task Force which performed the remarkable feat of bombing Japan proper, cannot be so foolish as to reveal its position by using radio. It should be remembered that the enemy *listens!* He listens always—and he has most excellent ears. Not only does he listen but if the American Task Force had given away their location by radio, the Japanese listening posts would have known the exact spot from which the broadcast originated by what is known as *triangulation.* By having two Japanese stations several hundreds of miles apart draw a bead on American naval vessels on the high seas, its exact location is divulged within a matter of minutes. Then it would be a simple matter for the Japanese War Department to notify its naval units in order to intercept the American Squadrons—and that is precisely the reason why an attacking force not in its own home waters cannot use its radio transmitters safely. While our Navy has ears too, and excellent ones, with which to listen it cannot talk back except under unusual circumstances.

Remember also that we have a terrific disadvantage when we attack Japan, on account of the vast distances which our Navy must traverse in order to get at the enemy. Therefore it will take days and perhaps weeks for the Navy Department to finally announce a victory or a battle that took place long ago, with the results which may already have been broadcast by the enemy.

Thus during war time, even with the modern instrumentality of radio, we are back to the sailing vessel days, as far as quick communication with the home land is concerned.

That is a regrettable matter but in war safety comes first and I firmly believe that the odd situation in which we find ourselves today will not prevail in the future.

I am certain that before very long American naval units will find a way to overcome this great silence handicap. I suggest one method how the problem may be solved with perfect safety to the Navy.

I refer to the *Radio Sonde,* which has been used and is still being used a great deal to make meteorological observations. These radio Sondes are small balloons, only a few feet in diameter which take aloft an extremely light-weight radio transmitter. Nowadays they are sent up into the stratosphere where the balloon bursts. The radio Sonde then descends by a small silk parachute. Going up as well as coming down a small radio transmitter sends a series of signals to earth which give the listening scientists certain information as to air conditions up in the stratosphere.

Suppose in the future the Navy, after completing its task, wishes to transmit a complete communique to a distant or home base. The message is prepared on a perforated paper tape with the code punched in holes. This tape is wound on a light spring motor and the radio Sonde is then liberated from the Naval Task Force, whenever the naval vessels have reached the point which they know will be suitable for the purpose. Remember that the radio Sonde now is an *independent transmitter* that floats in the air and is carried along by the steady winds of the upper stratosphere. The balloon is adjusted in such a manner that it can stay aloft as long as necessary before bursting. A small clock-work which can be set for any pre-determined time will begin to operate the short wave radio transmitter within 12 or 24 hours or whatever lapse of time unit is considered safe. A few non-radio trial balloons will have been sent aloft first to find out the direction of the wind. Then when the radio Sonde is ready to transmit its message to the world it may be a thousand miles or more distant from the ship that released it. It therefore can not reveal a vital position nor can it possibly give aid to the enemy.

More important than the actual official message from our own fighting forces at sea, it will give us concrete facts rather than vague talk. Broadcasts by the enemy to those interested always understate or minimize facts rather than to tell the full truth.

The radio Sonde cost only a trifling amount of money and can be sent aloft at a cost of less than $100. It is destroyed when it sinks into the sea, or for that matter some means can be used to destroy it by explosives, if this should be deemed necessary, upon landing either on land or sea. There appears to be no valid reason why such radio Sondes should not be used soon.